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AUTHOR Pearson, Judy C.; West, Richard
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ABSTRACT

Student question-asking is essential to the learning process, and yet little is known about this communicative phenomenon. More important, the research that is available suggests that students ask far fewer questions than might be expected by educators. An exploratory study examined 15 college communication classrooms and determined that: (1) students asked only an average of about 3.3 questions per hour; (2) male teachers received more questions than did female teachers; (3) female students asked fewer questions than did male students in courses taught by males; and (4) self-reported masculinity, which includes elements of independence, assertiveness, and task-orientation, was associated with a greater likelihood of question-asking. (Author/SR)

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School of Interpersonal Communication
Ohio University
Athens, Ohio 45701
(614) 593-4828

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An Initial Investigation of Gender on Student Questions in the Classroom: Developing a Descriptive Base

Judy C. Pearson
and
Richard West*

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An Initial Investigation of Gender on Student Questions in the Classroom: Developing a Descriptive Base

Abstract

Student question asking is essential to the learning process, and yet little is known about this communicative phenomenon. More important, the research that is available suggests that students ask far fewer questions than might be expected by educators. This exploratory investigation examines 15 college communication classrooms and determines that students ask only an average of about 3.3 questions per hour, that male teachers receive more questions than do female teachers, that female students ask fewer questions than do male students in courses taught by males, and that self-reported masculinity, which includes elements of independence, assertiveness, and a task-orientation, is associated with a greater likelihood of question asking.

The purpose of this investigation is to assess the impact of teachers' biological sex, students' biological sex, and students' psychological sex-role on students' questioning behavior in the classroom. Questioning has been identified as "the quintessential aspect of teaching" (Perez, 1986, p. 63). For example, Postman and Weingartner (1969) observed, "The art and science of asking questions is the source of all knowledge. Any curriculum of a new education would, therefore, have to be centered around question asking" (p. 89). Classroom teachers identify student question asking as critical to successful participation in the educational setting (Salend & Lutz, 1984).

Teachers' questions in the classroom have been examined extensively (Andre & Anderson, 1979; Dunkin & Biddle, 1974; Hare & Pulliam, 1980; Redfield & Rouseau, 1981; Rosenshine, 1976; Winne, 1979). Findings indicate that, for example, an increased number of teacher questions is related to an increase in student levels of achievement (Gall, 1984); also, higher cognitive questions, which encourage independent and critical thinking, may particularly enhance learning (Andre & Anderson, 1979; Heath & Nielsen, 1974; Redfield & Rouseau, 1981). Unfortunately, higher order cognitive questions are difficult to integrate into one's teaching (Wilson, 1985). Teachers appear to use fact questions--those that require simple recollection of information--60% of the time, higher level cognitive questions 20% of the time, and procedural questions about 20% of the time (Hare & Pulliam, 1980).

Although students' questions have not received the same amount of attention, empirical attention has recently been focused on this area of inquiry (Corno & Rohrkemper, 1985;

Darling, 1989; Dillon, 1982, 1986; Gall, 1984; Good, 1981; Good, Slavings, & Mason, 1988; Good, Slavings, Harel, & Emerson, 1987; van de Meij, 1989). Educators have been clear in their call for additional research in this area (Barker, 1974; Gall, 1970; Houston, 1938; Hunkins, 1966; Sadker & Cooper, 1974a).

Research by Dillon (1981c) suggests that student questions signal confusion and misunderstanding. Darling (1989) found that students use different methods for resolving their lack of comprehension in the classroom. Kendrick and Darling (1990) determined that students use multiple tactics to cope with their problems in understanding: they are most likely to request elaboration from the teacher, indicate their confusion, ask for an example, or to ask the teacher for repetition of a message.

While some students ask questions in the classroom, others do not. Dillon (1981a) reasoned that, "Despite their theoretical importance to learning and teaching processes, there appears to be a practical norm against student questions in the classroom" (p. 136). Susskind (1969) examined 32 elementary classrooms and observed an average of two teacher questions per minute and two student questions per half-hour. The lack of questions within the classroom has been of concern to educational theorists and practitioners; it is of even greater relevance to communication educators who examine classroom verbal and nonverbal interactions.

Dillon (1981b; cf. van de Meij, 1989) reported that students do not ask questions because they fear negative reactions from the teacher. Similarly, students may avoid question asking if they do not feel there is an advantage to asking them, e.g., if

they feel that the teacher is unwilling to respond (van de Meij, 1989).

Ortiz (1988) suggested that question asking is viewed as an extraordinarily taxing skill for some students. He cited McCroskey's (1977, for example) large body of research that places 15 to 20% of all students as communicatively apprehensive. This debilitating malady disallows any form of interaction in the classroom, much less the asking of questions.

Although passive and apprehensive students refrain from question asking (Good et al., 1988), students who are particularly unlikely to ask questions may be those who are not called upon frequently, those who are often criticized for the wrong answer, and those who seem to provide the wrong response rather than the right response (Good et al., 1987). Over time, low-achieving students ask fewer and fewer questions (Good et al., 1988). Furthermore, higher achieving students ask more substantive questions than do lower achieving students; lower achieving students are more likely to ask procedural questions (Good et al., 1987).

van der Meij (1989) found that another characteristic associated with low question asking by both girls and boys was an internalized sense of independence. In his study of third-grade and fifth-grade Dutch children, 80% explained that they did not ask questions because they wanted to solve a problem on their own or they wanted to complete a task by themselves.

Finally, students may not feel that their role is to ask questions of teachers. Kendrick and Darling (1990) noted that "students may see it as the teacher's responsibility to 'be

clear'" (p. 28). International students and members of some subcultures may view question asking as rude or inappropriate. Socialization, communication competence, and different perceptions by different groups of learners may all affect question asking.

This review suggests an irony in classrooms: While questions are integral components of the teaching-learning process, students fail to ask them. Further, the research has focused upon elementary or middle-school classrooms; investigators have not considered the college classroom. The question is a communicative event and integral to instructional communication research. Thus, we offer the following research questions:

RQ_1: How many questions do college students ask in each hour of instruction?

RQ_2: What kinds of questions do college students ask?

Gender in the Classroom

Expectancy effects impact many teacher-student behaviors. Teachers do not perceive all students to be equally capable and those determined to be less able are provided with dramatically different learning opportunities from those presumed to be more able. One group of researchers explained, "Students in a class do not always experience the same environment" (Good et al., 1987, p. 181). Students with high potential receive more stimulating opportunities (Brophy & Good, 1986; Weinstein, 1976).

Teachers do not communicate their expectations of students in direct and verbal messages. Badini and Rosenthal (1989) concluded, "The bulk of the findings suggest that the

transmittal of expectations depends to a substantial degree on unintended, nonverbal communication" (p. 162). Students are aware of differential expectations. Females are more sensitive to those expectations when they have access to visual cues, as is normally the case in the classroom.

Students may learn more about power relationships than subject matter in their interactions with teachers in the classroom. Teachers do not treat males and females similarly, thus they encourage differences between women and men, and they evidence bias against women (Pearson, in press; Stewart, Stewart, Friedley, & Cooper, 1990). Countless studies demonstrate that when women and men engage in identical behavior, the behavior is devalued for the woman. For example, Goldberg (1968), in a classic study, showed that when an identical essay was attributed either to a woman or to a man, the essay was given a higher grade when evaluators believed it to be written by a man. Furthermore, both women and men demonstrated the same prejudice.

In another frequently cited essay, Hall and Sandler (1982) argue that women are at a "significant disadvantage" in the college classroom. Female students are less involved in classroom interaction, have less confidence, and have lower expectations. The teacher's communicative behaviors may encourage these outcomes. Teachers provide more overt disparaging remarks to female students, are more likely to discourage classroom participation from women, and prevent female students from seeking additional help. Cooper (1987) adds that teachers tend to use sexist language, call on male students more often than on female students, and ask male

students questions that encourage critical thinking or evaluation while female students are asked to regurgitate factual material. Sadker and Sadker (1985) indicated that at all grade levels, and in all subject areas, male students had more opportunities to interact than female students. In addition, educators are unaware of the impact of this bias (Sadker & Sadker, 1986).

Since students are treated differently, it is not surprising that they begin to evidence different interaction patterns within the classroom. Student questions in the classroom have been analyzed for possible gender differences. Two studies found that boys ask more questions than girls in K-12 classrooms (Good, 1981; Lockheed & Hall, 1979). No research exists on sex differences in student questioning in the college classroom.

Male teachers may be more responsible for differential treatment of students than female teachers. In two studies, Rosenfeld and Jarrard (1985, 1986) examined collegiate classroom interaction and showed that sexism is primarily a "male disease" (Rosenfeld & Jarrard, 1986, p. 161). Student perceptions of the classroom climate was dependent on whether the class was liked or disliked and whether the professor was male or female. Student coping behaviors, such as daydreaming and hiding one's feelings, were used only in the classes of male professors. This is especially relevant on the collegiate level where most teachers are still male.

Gender clearly impacts the classroom setting (Hall & Sandler, 1982; Pearson, 1985; Sadker & Sadker, 1985; Stewart et al., 1990). We were interested in examining the effect of students' biological sex on question frequency and question type

and whether male and female teachers differ in the frequency of questions received from students. To that end, the following research questions were developed.

RQ_3: Do male and female college students differ in their frequency of question asking in the classroom?

RQ_4: Do male and female college students differ in the types of questions they ask in the classroom?

RQ_5: Do male and female teachers differ in the frequency of questions they receive from students in the college classroom?

Finally, we were interested in determining whether there were differences between students who ask questions and students who do not ask questions. Previous research has shown that question asking is linked to independence (van der Meij, 1989) and that independence is a primary component of masculinity (Bem, 1974; Spence & Helmreich, 1978).

RQ_6: Is there a significant difference in the frequency of question asking by people who perceive themselves as high in masculinity and those who perceive themselves low in masculinity?

METHOD

Participants

Participants for this study were 331 students (157 males; 174 females) and 15 instructors (9 males; 6 females). The breakdown of academic status showed that 42% of the students were seniors, 32% were juniors, 22% were sophomores, and fewer than 1% identified themselves as first year students.

Procedures

Fifteen instructors granted permission to audio tape a one-hour class period that included student interaction. The classes averaged 22 students and were all undergraduate communication courses. The instructors were told that they were part of a research study on teacher-student communication behaviors in the classroom. Once a particular class began, a coder distributed a questionnaire that included a request for demographic information and the Personal Attributes Questionnaire (PAQ; Spence, Helmreich, & Stapp, 1974).

The coder collected the questionnaires and then taped the classroom interaction. Coders were inconspicuous, sitting in the back of the room and not interacting with the students before, during, or after the class session.

Coding System

A coding system created by Good et al. (1987) was used to gather interaction data. Although Good's framework has been criticized for being too global and not sufficiently sensitive to dealing with specific learning problems (Darling, 1989), his typology is appropriate for this exploratory investigation. The classification scheme has been used in K-12 classrooms, yet its applicability to the college level is apparent. The system requires coding nine types of questions and one "unknown" category:

Explanation: request meaning or reasons that will help students understand a concept, idea, task, or procedure.

Information: seek specific, factual, academic information.

Clarification: request clarification of information, procedures, comments, or tasks provided by the teacher or others.

Confirmation: seek confirmation of a completed student response, procedure, or task.

Procedural: concern classroom procedures.

Non-task curiosity: display academic curiosity unrelated to the immediate task.

Diversion: divert the teacher's or others' attention from the task at hand.

On-task attention: related to the immediate task and intended primarily to draw attention to the individual student or to "show off."

Off-task attention: unrelated to the task and intended primarily to draw attention to the individual student or to "show off." These questions differ from those in the diversion category in that they are intended to draw attention to the student, not to divert the teacher's or class's attention from the task at hand.

Unknown--cannot be coded into the above categories.

College communication classrooms were analyzed using audio tapes and observational data from two independent coders. The original Good et al. (1987) coding scheme required coders to record both student comments and student questions. Since questions were the exclusive interest in this investigation, student comments were not coded. The five manifest conditions and instances recorded and examined were (a) classroom location of the student asking the question, (b) the specific question asked, (c) the type of question asked, (d) the sex of the

student asking the question, and (e) general observations of the classroom.

Because this investigation initiates a line of research on student questions in college classrooms, coding reliability was of paramount importance. Thus, reliability procedures that included joint coding of a pilot classroom and an examination of questions emerging from that classroom were conducted with the two coders and the trainer. Training of coders continued until an inter-rater reliability of .90 was attained. The coding of the categories in the actual study was .90, as well.

Instrumentation

The Personal Attributes Questionnaire (PAQ; Spence et al., 1974; 1975) measures an individual's psychological sex-role using a five-point Likert-type scale. The bi-polar traits identified by Spence and her colleagues can be categorized into stereotypical masculine traits, stereotypical feminine traits, and androgynous items that reflect both masculine and feminine qualities.

The PAQ allows separate measures of masculinity and femininity. People are determined to be masculine (above the median in masculinity and below the median in femininity), androgynous (above the median in masculinity and above the median in femininity), feminine (above the median in femininity and below the median in masculinity), or undifferentiated (below the median in masculinity and below the median in femininity). Since we were only concerned with masculinity (identified as independent, dominant, competitive, willing to make decisions, persistent, self-confident, superior, and standing up under

pressure), a median split on that scale was used to group people into high and low masculine groups.

The masculinity subscale comprised of the 8 items identified above is statistically independent of the femininity subscale (Spence & Helmreich, 1978). Prior research reports reliability levels ranging from .55 to .85 for the masculinity subscale (Bonaguro, 1986; Bonaguro & Pearson, 1986; Wilson & Cook, 1984; Yoder, Rice, Adams, Priest, & Prince, 1982). Cronbach alpha in this study for the masculinity subscale was .68.

RESULTS

RQ_1: How many questions do college students ask in each hour of instruction? Because this study is exploratory, we determined the frequency of questions asked in classrooms. A total of 49 questions emerged from over 900 minutes of classroom discussion time. These numbers suggest that an average of 3.3 questions were asked each hour by college students.

RQ_2: What kinds of questions do college students ask? Results, displayed in Table 1, indicated that the most frequently asked question in this study was the clarification question. In descending order of frequency, the remaining types of questions asked were information-seeking questions, questions of natural curiosity, questions soliciting explanation, procedural questions, and finally, questions that were divergent in nature. No questions were observed that were coded as off-attention, on-attention, confirmation, or unknown.

RQ_3: Do male and female college students differ in their frequency of question asking in the classroom? A chi-square test revealed no significant difference in the frequency of

questions asked by males and females (χ^2 = 1.66, df = 1, $p < .25$)

RQ_4: Do male and female college students differ in the types of questions they ask in the classroom? The chi-square test indicated no significant difference between males and females with regard to the frequency of the types of questions they ask (χ^2 = 4.36, df = 5, $p < .4$).

RQ_5: Do male and female teachers differ in the frequency of questions they receive from students in the college classroom? The chi-square test revealed a significant difference between the frequency of questions received by male and female instructors (χ^2 = 8.18, df = 1, $p < .005$). Ancillary analysis indicated that males ask more questions than females in classes taught by males (χ^2 = 4.82, df = 1, $p < .03$). However, there were no sex differences between female and male students in their question asking frequency of female teachers (χ^2 = 1.2, df = 1, $p < .30$). Table 2 displays the number of questions by students' sex and teachers' sex.

RQ_6: Is there a significant difference in the frequency of question asking by people who perceive themselves as high in masculinity and those who perceive themselves low in masculinity? The chi-square test showed a significant difference in masculinity between questioning and non-questioning students (χ^2 = 4.86, df = 1, $p < .03$). Students with a higher masculine orientation asked questions more frequently (an average of 2.4 questions per hour) than did those with a lower masculine orientation (an average of .9 questions per hour).

student speaks up. A positive, welcoming response to initial questions may guarantee additional probes and secondary questions (Dillon, 1981c). Finally, teachers must understand the nature of students' previous school experiences. Early negative experiences may overshadow the collegiate atmosphere of open inquiry and full provisions for student questioning.

Not only did college students ask relatively few questions, they also asked relatively low-level, clarification-type, e.g., "Could you repeat that one more time?" and "What do you mean by that?" The large percentage of this question type is not surprising in light of the literature on listening in the classroom. Wolvin and Coakley (1985) asserted that "the most neglected language art skill at all education levels . . . is listening" (p. 17). Thus, questions of clarification would most likely be used by students to help correct their listening deficiency.

This preliminary study found no differences in the frequency and types of questions asked by male and female college students. This finding is intriguing in view of the research on sex-role stereotypes in the classroom. If "male students often dominate classroom talk" (Stewart et al., 1990, p. 160) and teachers call on male students more often and respond more extensively to male students' comments than to female students' comments (Hall & Sandler, 1982), then one would expect males to ask more questions than females. However, this finding should be interpreted cautiously because this difference did appear in the classes of male instructors. While no previous research has addressed a proclivity of males and females to particular

DISCUSSION

The purpose of this study was to examine student questions in the college classroom. The study was exploratory and descriptive, and the results should be interpreted within that frame. The investigation showed that students ask relatively few questions in the collegiate classroom. This finding is critical since educators have long realized that "questioning can be a central feature in promoting the development of conceptual abilities, analytical techniques, and the synthesis of ideas" (Napell, 1976, p. 82). When students fail to ask questions, they limit their own potential.

Both teachers and students share the responsibility for their joint interaction within this setting. As educators, we have a responsibility to ensure that students acquire "question literacy." Nearly three decades ago, Carner (1963) observed that the ability to ask questions in an effective manner does not develop naturally within individuals and that students require specific training in effective questioning strategies. Well-planned, systematic instruction; behavioral modification techniques; and the modeling of effective questioning strategies may all play a role in student competence in this area.

Students need instruction and modeling in effective and appropriate question asking; teachers may similarly need to alter their behaviors. Perhaps most important is establishing a positive and supportive climate (Ortiz, 1988; Rosenfeld & Jarrard, 1985, 1986). Teachers must practice effective listening; they should presume that students have questions, even in the absence of them. In addition, they should be particularly alerted to potential questions when just one

question types, the frequency issue is one that should receive future empirical attention.

Male instructors received more questions than female instructors. Further, male students were found to ask more questions than female students in the classes of male instructors. These results support the existence of a masculinist culture in higher education (Bate, 1988). The results also suggest that the perception of the instructor may affect the frequency of questions asked by male students. Karp and Yoels (1976) found that when an instructor is male, male student interactions are three times more frequent than female student interaction.

Communication educators, like other educators, have expectations for students that may vary as a result of the student's biological sex or his or her subculture. Our expectations and bias have been shown in a variety of our behaviors including our grading of tests and our evaluating of performances (see, for example, Pearson, 1975; Sprague, 1971; Stiggins, Backlund, & Bridgeford, 1985).

Males and females do not ask a significantly different number of questions in females' classes. These findings might best be explained by identifying the apparent "confusion" surrounding classes taught by women. Treichler and Kramarae (1983) discovered that students view classes taught by females as more discussion-centered. Therefore, one would expect these classes to have more student interaction and hence, more student questioning. Yet, increased student participation results in female teachers being perceived as less competent (Macke & Richardson, 1980). If students perceive classrooms of female

instructors as discussion-oriented and perceive female professors as less competent, they may be less eager to ask questions.

One's masculinity significantly divides questioners from non-questioners in the college classroom. These results are aligned with the literature on sex-roles and sex-role stereotyping. Masculine self-perceptions such as independence, dominance, and acting as a leader (Wheeless & Dierks-Stewart, 1981) suggest that question asking in the classroom would be a consistent behavior for these individuals. This linkage may not be consistent developmentally. van der Meij's (1989) study of elementary school children showed that independence mitigated against question asking.

This study showed that questions in the classroom vary as a function of teachers' biological sex, and within males' classrooms, as a result of the students' biological sex. The differences in students' biological sex may be attributed to different personality characteristics, most notably the absence or presence of stereotypically masculine characteristics such as independence, persistence, and self-confidence. However, the relatively low level of questions overall in collegiate classrooms coupled with the sex differences that were observed suggests that the teachers' behavior and/or the classroom climate contribute to the differences.

Although question asking has been identified as a quintessential aspect of teaching, this investigation showed that college students ask relatively few questions in the classroom. Students who ask questions tend to be those who view themselves as independent and self-confident. Male professors

receive more questions than do females, but the bulk of those questions are from male students. At the same time, college campuses are increasingly female in the number of students enrolling in both baccalaureate and graduate programs. Dillon (1981a) concludes, "Each time a question arises, a mind opens to learning. That is just the opening we are looking for. Oddly enough, it can be kept closed by an implicit norm against student questions, frustrating the effort to learn and to teach" (p. 139).

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Table 1

Types of Questions Asked by College Students

Question Type:	Asked by Males	Asked by Females
Clarification	7 (14%)	10 (20%)
Information-Seeking	7 (14%)	3 (6%)
Natural Curiosity	5 (10%)	4 (8%)
Soliciting Explanation	5 (10%)	2 (4%)
Procedural Questions	2 (4%)	2 (4%)
Divergent Questions	2 (4%)	0 (0%)
Total	28 (57%)	21 (43%)

Table 2

Number of Questions Asked by Male and Female College Students in Classes Taught by Male and Female Instructors

	Male Instructor	Female Instructor
Male Students	24 (49%)	5 (10%))
Female Students	11 (22%)	9 (18%)
Total	35 (71%)	14 (28%)

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